Got your message
Jim.Stefanoff to: Chris Bellovary 04/12/2011 12:37 PM

History: This message has been replied to.

Hi Chris,

Sounds like the diversion system is still setup and ready to implement. Thanks for the update. I'll let Gary Fulton (CTP Manager) and Ed Moreen know.

Jim

Jim Stefanoff, P.E.
Principal Technologist
Mine Restoration
CH2M HILL
717 West Sprague Avenue, Suite 800
Spokane, WA, USA 99201-3915
Office Phone: 509-464-7202
Cell Phone: (b) (6)
Jim.Stefanoff@ch2m.com

BHM: New General Manager

Chris Bellovary to: Jim.Stefanoff 04/07/2011 02:53 PM

Jim -

I spoke with Lauren at the New Bunker Hill Mine. The new general manager is Don Laeding. He is currently in the mines, and not expected back in the office until around 4:30 pm MDT, and she is going to have him call back when he does.

Lauren said that she will have him call me when he gets back in the office, but knows that he won't know anything about the sandbag wall. I looked up their business records, and Mr. Laeding's address is listed as a P.O. Box out of Bisbie, Arizona, so my guess is that might not be the only thing that he doesn't know about the mine.

Since you did the original inspection with Mr. Hopper, would you be available to meet with Mr. Laeding to show him where the sandbags are and how the emergency plan was supposed to work? If you have alternative suggestions that might work better, just let me know.

Thank you Jim.

- Chris

Chris Bellovary; EIT, J.D.
U.S. EPA - Region 10
Superfund Project Manager
Office of Environmental Cleanup
Direct Line: 206-553-2723

RE: New General Manager
Jim.Stefanoff to: Chris Bellovary 04/07/2011 03:19 PM

2 attachments

12-19-2002 Photos Trial Diversion.ppt Trial Diversion Memo.PDF

Hi Chris,

Yes, I can meet with Mr. Laeding and go through it with him. Attached is a report and photos which provide information as well.

Jim

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Principal Technologist
Mine Restoration
CH2M HILL
717 West Sprague Avenue, Suite 800
Spokane, WA, USA 99201-3915
Office Phone: 509-464-7202
Cell Phone: (b) (6)
Jim.Stefanoff@ch2m.com

From: Bellovary.Chris@epamail.epa.gov [mailto:Bellovary.Chris@epamail.epa.gov]
Sent: Thursday, April 07, 2011 2:53 PM
To: Stefanoff, Jim/SPK
Subject: BHM: New General Manager

Jim -

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Thank you Jim.

- Chris

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U.S. EPA - Region 10
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Looking downstream at back of trial diversion dam on 9 Level. The dam is constructed across the Kellogg Tunnel just past (north) of the Barney Switch. The dam is made from sandbags, boards, and plastic tarps. Additional sandbags, boards, and tarps are stored to the right of the photo. The depth of water behind the dam is about 2 feet on the sides, and about 3 inches above the rail in the middle. The flow being dammed is about 1550 gpm. About 50 gpm was leaking through the dam, although this could be readily reduced by another layer of sandbags on the downstream face. The dam would have to be increased in height for higher flows. The reported construction time was 30 minutes.

Looking upstream at the face of the trial diversion dam.

Looking upstream at the face of the trial diversion dam.

Stockpiled dam building materials located to the side of the dam site. Materials consist of sand bags, boards, and plastic tarps.

Dammed water backing up the Barney Drift (right side photo) and draining down the Barney Vent Raise (left side photo). The top of the raise is located below the old ore car. The trial diversion dam is about 100 feet behind these photos.

Dammed water draining down the Barney Vent Raise. The top of the raise is located below the old ore car.

Looking upstream towards the bottom of the Barney Vent Raise on 10 Level. The bottom of the raise is about 200 feet up this drift. The debris and muck in the bottom of the drift accumulated when water drained into the raise to clean it out must have built up--then suddenly blew out carrying the debris with it. The diverted water is flowing across the top of the debris and muck. The depth of the debris increases towards the raise. At the back of this drift near the bottom of the raise the debris is up to within one to two feet of the ceiling. Removal of this debris would be very difficult. There appears to be adequate open space for water flow.

Evaluation of Trial Bunker Hill Mine Water Diversion

TO: Cami Grandinetti/USEPA

FROM: Jim Stefanoff/CH2M HILL
Bill Hudson/CH2M HILL

DATE: December 20, 2002

On December 19, 2002 Jim Stefanoff and Bill Hudson observed a trial mine water diversion in the Bunker Hill Mine. The purpose of the trial was to test a proposed diversion approach using a temporary dam across the Kellogg Tunnel to back water into the Barney Vent Raise and down to 10 Level. The trial was conducted by employees of The New Bunker Hill Mining Company (NBHMC).

Observations

The attached photos show the trial diversion dam. The dam was constructed from sand bags, boards, and tarps across the Kellogg Tunnel just downstream (north) of the Barney Switch. Dam construction materials are stored adjacent to the dam site. The total mine water flow dammed and diverted to 10 Level was about 1550 gpm. About 50 gpm was leaking through the dam, although this could be readily reduced by another layer of sandbags on the downstream face. The depth of water behind the dam during was about 2 feet on the sides, and about 3 inches above the rail in the middle. The dam would have to be increased in height for higher flows. The reported construction time for the trail dam was 30 minutes.

The diverted water flows to 10 Level via the Barney Vent Raise. The New Bunker Hill Mining Company cleaned out the raise over the last three or four weeks through a combination of digging accumulated muck from the bottom and by sluicing water from above. The last sluicing event resulted in a large volume of debris and muck to suddenly flow from the bottom of the raise into the drift on 10 Level. The depth of the debris increases towards the bottom of the raise, and varies from about 1 foot 200 to 250 feet away to within about one to two feet of the drift ceiling near the bottom of the raise. Removal of this debris would be very difficult due to its large volume and lack of rail access. The approach to this area requires a climb down a series of ladders in the Orr Raise, and then wading through water up to three feet deep. There appears to be adequate open space at the bottom of the raise for water flow up to the 7,000 gpm required capacity.

Recommendations

Based on the trial the proposed diversion approach is acceptable. The proposed approach is simple and provides flexibility to quickly accommodate a range of flows. The following are recommendations for operation and maintenance of the diversion system:

- The amount of stockpiled diversion building materials should be increased by about 50 percent. This is to ensure an adequate supply for high flows.

- The diversion dam location needs to be kept clean so that the tunnel cross-section is constant. This will reduce dam construction time.
- The Barney Vent Raise should be inspected from the top and bottom a minimum of twice per year, and more frequent if there is doubt concerning its ability to convey up to 7,000 gpm.
- The Barney Vent Raise should be hydraulically flushed at least once per year, and more frequent if needed to provide 7,000 gpm capacity. The flushing volume should be as high as practical. The duration should be as needed for cleanout.
- The mine crew should periodically practice diversion dam construction. Written procedures should be developed by NBHMC and posted at the diversion location. This may be a good time for hydraulically flushing the Barney Vent Raise.

Photo 1

Looking downstream at back of trial diversion dam on 9 Level. The dam is constructed across the Kellogg Tunnel just past (north) of the Barney Switch. The dam is made from sandbags, boards, and plastic tarps. Additional sandbags, boards, and tarps are stored to the right of the photo. The depth of water behind the dam is about 2 feet on the sides, and about 3 inches above the rail in the middle. The flow being dammed is about 1550 gpm. About 50 gpm was leaking through the dam, although this could be readily reduced by another layer of sandbags on the downstream face. The dam would have to be increased in height for higher flows. The reported construction time was 30 minutes.

Photo 2

Looking upstream at the trial diversion dam.

Photo 3

Stockpiled dam building materials located to the side of the dam site. Materials consist of sand bags, boards, and plastic tarps.

Photo 4

Dammed water backing up the Barney Drift (right side of photo) and draining down the Barney Vent Raise (left side of photo). The top of the raise is located below the old ore car. The trial diversion dam is about 100 feet behind these photos.

Photo 5

Dammed water draining down the Barney Vent Raise. The top of the raise is located below the old ore car.

Photo 6

Looking upstream towards the bottom of the Barney Vent Raise on 10 Level. The bottom of the raise is about 200 feet up this drift. The debris and muck in the bottom of the drift accumulated when water, drained into the raise to clean it out, must have built up--then suddenly blew out carrying the debris with it. The diverted water is flowing across the top of the debris and muck. The depth of the debris increases towards the raise. At the back of this drift near the bottom of the raise the debris is up to within one to two feet of the ceiling. Removal of this debris would be very difficult. There currently appears to be adequate open space for water flow.

Bunker Hill In-Mine Diversion
Jim.Stefanoff to: Chris Bellovary 04/07/2011 03:12 PM

History: This message has been replied to.

1 attachment

Draft Diversion Criteria.PDF

Hello Chris,

I think the points listed in the attached document were incorporated into a letter that was sent to Bob Hopper, or perhaps into a revised order? I don't recall.

Jim

Jim Stefanoff, P.E.
Principal Technologist
Mine Restoration
CH2M HILL
717 West Sprague Avenue, Suite 800
Spokane, WA, USA 99201-3915
Office Phone: 509-464-7202
Cell Phone: (b) (6)
Jim.Stefanoff@ch2m.com

Draft Criteria for In-Mine Storage

Water to be Stored

- Store all mine water which originates upstream of the Barney Switch within the mine, including the east side (Milo) gravity flows, the west side (Deadwood) gravity flows, and the lower country (mine pool) pumped flows.

Required Storage Volume

- Provide storage volume using the mine workings (all void space) from a minimum of 30 feet below the sill of 11 Level at the No. 2 Raise to the sill of 10 Level at the No. 2 Raise.

Diversion Type and Location

- Provide a sand-bag-type diversion dam constructed across the Kellogg Tunnel just downstream from the Barney Switch which backs up all mine water into the Barney Vent Raise, similar to that demonstrated to EPA representatives on December 19, 2002.

Diversion Hydraulic Capacity

- The hydraulic capacity for the diversion is to be a minimum of 7,000 gpm.

Diversion Response Time

- The diversion is to be operational within four hours of request by EPA or EPA's designated representatives.

Diversion Operation

- The diversion is to be operated until notice is provided by EPA or EPA's designated representatives that it may be removed.

Diversion Maintenance

- The amount of diversion building materials kept at the diversion location should be increased by a minimum of 50 percent as was present during the December 19, 2002 trial diversion. Enough materials shall be present to rapidly build a diversion having the required capacity.
- The diversion dam location, Barney Vent Raise entrance, and adjoining ditches are to be kept serviceable and in operable condition at all times for diversion dam construction and operation.
- The Barney Vent Raise should be inspected from the top and bottom a minimum of twice per year, and more frequent if there is doubt concerning its ability to convey the required capacity.
- The Barney Vent Raise should be cleaned, by hydraulic flushing or other means as required at least once per year, and more frequently if needed, to provide the minimum hydraulic capacity.

- Diversion dam construction is to be periodically practiced, at least once per year, or more frequently as needed to ensure the required diversion response time can be met.
- Written diversion construction procedures are to be developed, posted at the diversion location, and kept updated, which provide sufficient detail for diversion construction by all crew members.